



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,674	12/28/2001	Guy L. Steele JR.	06502.0377	4634

7590 11/03/2004
Finnegan, Henderson, Farabow,
Garrett & Dunner, L.L.P.
1300 I Street, N.W.
Washington, DC 20005-3315

EXAMINER

DO. CHAT C

ART UNIT	PAPER NUMBER
----------	--------------

2124

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/035,674	Applicant(s) STEELE, GUY L.	
	Examiner Chat C. Do	Art Unit 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/28/01;3/08/02;4/26/02;11/19/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/8;3/27;11/19</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The applicant is advised to update the information under the “related applications” section in page 2 of the present application.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the limitations “subprecise operand” and “non-subprecise operand” in line 2 are unclear whether the subprecise operand and non-subprecise operands are just a normalized operand and un-normalized operand respectively or the delimited representation wherein the delimited representation is undefined clearly. For examination purposes, the examiner considers the subprecise operand and non-subprecise operands are just a normalized operand and un-normalized operand respectively. Claims 8 and 16 have the same rejection.

Re claim 5, the limitation "delimited normalized format" in line 2 is unclear whether it is just as a normalized format or a presentation of a delimited format as cited in prior U.S. Patent No. 6,131,106. For examination purposes, the examiner considers the delimited normalized format is just a normalized format. Claims 13 and 19 have the same rejection.

Thus, claims 2-4, 6-7, 9-12, 14-15, 17-18, and 20-21 are also rejected for being dependent on the rejected based claims 1, 8, and 16 respectively.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5-8, 13-16, and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Deerfield (U.S. 3,725,649).

Re claim 1, Deerfield discloses in Figure 2 a method for providing a floating point product (title and abstract) comprising: multiplying a sub-precise operand (28) and a non-sub-precise operand (22) using a plurality of intermediate stages (30, 34, 24 wherein each of these considers to be a stage); and correcting an error introduced (right shift 34, 28 and increment in exponent in 24; col. 4 lines 20-33) by the sub-precise operand by performing an operation in conjunction (e.g. in substantially parallel with producing

Art Unit: 2124

product) with a one of the plurality of intermediate stages utilizing a compensating summand (output of adder 32).

Re claim 5, Deerfield further discloses in Figure 2 the sub-precise operand is represented using a delimited normalized format with an implicit leading 1-bit (conventional normalized format as col. 1 lines 28-37).

Re claim 6, Deerfield further discloses in Figure 2 the one of the plurality of intermediate stages is selected wherein a substantial time delay to correct the error is avoided (col. 2 lines 20-32 as motivation).

Re claim 7, Deerfield further discloses in Figure 2 time consumed by multiplying the sub-precise operand and the non-sub-precise operand overlaps time consumed in correcting the error (accumulating partial products in 30, 32, and 34 is done substantially parallel with right shift control as output of 36 and exponent correction in 24).

Re claim 8, it is a system claim of claim 1. Thus, claim 8 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 13, it is a system claim of claim 5. Thus, claim 13 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 14, it is a system claim of claim 6. Thus, claim 14 is also rejected under the same rationale as cited in the rejection of rejected claim 6.

Re claim 15, it is a system claim of claim 7. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 16, it is a computer-readable medium claim of claim 1. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Art Unit: 2124

Re claim 19, it is a computer-readable medium claim of claim 5. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 20, it is a computer-readable medium claim of claim 6. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claim 6.

Re claim 21, it is a computer-readable medium claim of claim 7. Thus, claim 21 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 and 9-10 are rejected under 35 U.S.C. 103(a) as being obvious over Deerfield (U.S. 3,725,649) in view of Yeh et al. (U.S. 4,991,131).

Re claims 2 and 10, Deerfield do not disclose in Figure 2 multiplying the sub-precise operand and the non-sub-precise operand using a multiplier array comprising 3-to-2 adders. However, Yeh et al. disclose in Figures 3 and 16A a multiplier (46) for multiplying operands (M(X) and M(Y)) using a 3-2 adders array (full adder in Figure 16A). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add an array multiplier comprising 3-2 adders as seen in Yeh et al.'s invention into Deerfield's invention because it would enable to reduce the circuitry and efficiently carry the multiplication.

Art Unit: 2124

Re claim 9, it is a system claim of claim 2. Thus, claim 9 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Allowable Subject Matter

8. Claims 3-4, 11-12, and 17-18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. U.S. Patent No. 6,205,460 to Steele Jr. disclose a system and method for floating-computation for numbers in delimited floating point representation.
- b. U.S. Patent No. 5,666,301 to Makino discloses a multiplier carrying out numeric calculation at high speed.
- c. U.S. Patent No. 6,360,189 to Hinds et al. disclose a data processing apparatus and method for performing multiply-accumulate operations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

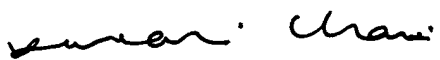
Art Unit: 2124

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2124

October 27, 2004


KAKALI CHAKI
SUPERVISORY PATENT EX.
TECHNOLOGY CENTER 2100